

Claims

- Sub A1 > 1. A coloring material comprising, as the color-imparting agent, chromoplast particles comprising crystalline lycopene, said chromoplast particles separated from a fruit which contained them and wherein the coloring material comprises from 500 to 3000 ppm of lycopene and wherein the material has a soluble solids concentration below 5° Bx.
2. A coloring material according to Claim 1, comprising as the color-imparting agent, chromoplast particles comprising crystalline lycopene, and further comprising color-neutral substances wherein the coloring material comprises from 500 to 3000 ppm of lycopene.
3. A coloring material according to Claim 1, wherein the chromoplasts are derived from tomatoes.
- Sub C2 > 4. A coloring material according to Claim 1, which has been water-washed to remove flavors.
5. A coloring material according to Claim 3, wherein the tomato is a high lycopene-content tomato variety.
6. A coloring material according to Claim 1, in dehydrated form.
7. A coloring material according to Claim 1, in frozen form.
- Sub A2 > 8. A process for preparing a coloring material comprising as a color-imparting agent chromoplast particles containing crystalline lycopene, comprising the steps of:
- a) selecting and pre-treating a lycopene-containing fruit by cleaning it;
 - b) breaking the fruit;
 - c) screening out solid components above a predetermined dimension; and;
 - d) separating by centrifugation a fruit serum from a material thus obtained, thereby

Sub A2>

obtaining a color concentrate comprising the said color-imparting agent:
 wherein the coloring material comprises from 500 to 3000 ppm of lycopene and
 wherein the material has a soluble solids concentration below 5° Bx.

9. A process according to Claim 8, wherein the fruit is tomato.

Sub C4>

10. A process according to Claim 8, further comprising water-washing the color concentrate, to remove water-soluble flavors.

11. A process according to Claim 8, further comprising processing the color concentrate to avoid microbial spoilage.

Sub C5>

12. A process according to Claim 10, wherein processing comprises any one of a number of preservation techniques, such as: aseptic packaging, freezing, canning or dehydrating, alone or with the addition of suitable food preservatives.

13. A method for producing a tomato product of constant color, comprising adding to the said tomato product a coloring effective amount of a coloring material as defined in Claim 1.

14. A tomato product colored with a material according to Claim 1.

15. Use of chromoplasts comprising crystalline lycopene as color-imparting agent.

16. Use of chromoplasts comprising crystalline lycopene for imparting color to food products.

17. A color concentrate, comprising chromoplasts comprising crystalline lycopene and color-neutral substances.

18. A coloring process which comprises using separated chromoplast particles comprising crystalline lycopene as a coloring material.

19. A process according to Claim 18, wherein the coloring material is used in food products.
20. A process according to Claim 18, wherein the chromoplast particles are tomato chromoplast particles.
21. A process according to Claim 18, wherein the chromoplast particles are in dehydrated form.
22. A process according to Claim 18, wherein the chromoplast particles are in frozen form.
23. A coloring material according to Claim 1, wherein the coloring material comprises at least 1000 ppm of lycopene.
24. A process for coloring food products which comprises the steps of;
 - a) cleaning and breaking tomatoes which comprise chromoplasts containing lycopene in the amount of at least 120 ppm
 - b) screening out solid components therefrom of a predetermined size;
 - c) separating a serum from a screened tomato material by centrifugation, thereby to obtain a color concentrate comprising said chromoplasts containing crystalline lycopene in a concentration from 500 to 3000 ppm and introducing said concentrate into said food products.
25. A process according to Claim 24 wherein unless said products are not tomato products, further comprising washing the color concentrate to remove the tomato flavor.
26. A process according to Claim 24 which comprises subjecting the color concentrate to size reduction.
27. A process according to Claim 26, wherein the size reduction is carried out by

Sub A3

Sub C6

processing the color concentrate in a colloid mill or microcutter.

28. A process according to Claim 24 further comprising processing the color concentrate prior to using it as a coloring material by subjecting it to one or more of the following preservation techniques: aseptic packaging, canning, freezing or dehydrating.

- sub A45
29. A nutraceutical, comprising, as the active ingredient, chromoplast particles comprising crystalline lycopene, said chromoplast particles being separated from a fruit which contains them and wherein the nutraceutical comprises from 500 to 3000 ppm of lycopene and wherein the material has a soluble solids concentration below 5° Brix and a carrier.

30. A nutraceutical composition according to Claim 29, wherein the chromoplasts are derived from tomatoes.

31. A nutraceutical composition according to Claim 29, which has been water-washed to remove flavors.

32. A nutraceutical composition according to Claim 30, wherein the tomato is a high lycopene-content tomato variety.

33. A nutraceutical composition according to Claim 29, in dehydrated form.

34. A nutraceutical composition according to Claim 29, in frozen form.

- sub A5
35. A process for preparing a nutraceutical composition comprising as the nutraceutical active ingredient, chromoplast particles containing crystalline lycopene, comprising the steps of:

- a) selecting and pre-treating a lycopene-containing fruit by cleaning it;
- b) breaking the fruit;
- c) screening out solid components above a predetermined dimension, and;
- d) separating by centrifugation, a fruit serum from the material thus obtained, thereby obtaining a lycopene concentrate comprising from 500 to 3000 ppm of lycopene and wherein the material has a soluble solids concentration

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36. A process according to Claim 35 wherein the fruit is tomato.
37. A process according to Claim 35 further comprising processing the lycopene concentrate to avoid microbial spoilage.
38. A process according to Claim 37 wherein processing comprises one or more preservation techniques, which are aseptic packaging, freezing, canning or dehydrating, alone or with the addition of suitable food preservatives.
39. A method for coloring a food product with a nutraceutical, wherein the nutraceutical is a chromoplast preparation containing crystalline lycopene, and wherein the nutraceutical agent comprises from 500 to 3000 ppm of lycopene.
40. A method according to Claim 39, wherein the chromoplast preparation is derived from tomatoes.

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